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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,745	06/30/2003	Canan Uslu Hardwicke	121278-1	1348
6147	7590	08/08/2007		
GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309			EXAMINER TUROCY, DAVID P	
			ART UNIT	PAPER NUMBER
			1762	
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			08/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/611,745	<b>Applicant(s)</b> HARDWICKE ET AL.	
	<b>Examiner</b> David Turocy	<b>Art Unit</b> 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 27, 28 and 271 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/22/2007 has been entered.

### ***Response to Amendment***

2. Applicant's amendments filed 6/22/2007, have been fully considered and reviewed by the examiner. The examiner notes that claims 1 and 17 have been amended and the cancellation of claim 28. In light of the cancellation of claim 28 the 35 USC 112 2<sup>nd</sup> paragraph rejection is deemed moot and therefore withdrawn. Currently, claims 1-24 and 27 are pending in this application.

### ***Response to Arguments***

3. Applicant's arguments, filed 6/22/2007 directed to the 35 USC 112 1<sup>st</sup> paragraph rejection has been considered persuasive and therefore the examiner has withdrawn the rejection.

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4. Applicant's arguments filed 6/22/2007 have been fully considered but they are directed to newly added limitations that were not present at the time of the final rejection and therefore will be addressed in the prior art rejections that follow.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-5, 10-20, 23, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Bunker et al. (US Patent No. 6,234,755).

Claim 1, Bunker et al. discloses a method for forming a flow director (by forming a slot over the holes) on a component comprising a wall, depositing at least one layer on the wall of the component wherein the deposition includes shaping the layer(s) in accordance with the predetermined shape of the slots and therefore forming the flow director (wall of slot) the formed layer extends radially (~90° from wall) outwards from the initial wall of the component and into a hot gas flow path (65) (column 2 lines 20-24, lines 50-60, figure 3). Bunker et al. discloses the coolant is directed from the film-

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cooling hole towards the hot surface of the wall, see arrows of coolant flow in figure 3. (Figure 3, Column 4, lines 15-22). The flow director (wall of slot) fails to extend over the exit site of the film-cooling hole that extends through the wall (see figures). The examiner notes that there are two walls to the slot and therefore there is a plurality of discrete flow directors for each slot and one of the flow directors is associated with one of the film cooling holes (Figures). Additionally, the examiner notes that Bunker discloses forming a slot over a row of holes and discloses multiple rows of holes and therefore teaches multiple slots, each over the multitude row of holes (Column 2, lines 45-50).

Claim 2, Bunker et al. discloses that the deposition comprises depositing a plurality of layers (column 2 lines 61-67) and shaping the layers using a mask to form the flow director, the slot (column 2 lines 50-60).

Claim 3, Bunker et al. discloses the wall has a cold surface and a hot surface (column 4 lines 15-20) with holes extending through the wall for flowing a coolant from the cold surface to the hot surface, and the deposition comprises depositing the layer(s) on the hot surface wall (column 4 lines 5-30, column 5 lines 47-67).

Claim 4, the flow director (the slot) comprises a method of directing the coolant flowing out of the exit site and towards the hot surface of the wall (column 2 lines 13-24) thus the coating acts to form the slot and modifies the flow of the coolant gas.

Claim 5, the flow director comprises a ridge extending along at least a portion of the exit site and further extending to a position downstream of the exit site (figure 4).

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Claim 10, the deposition can be more than one layer thus it is formed a plurality of times (column 2 lines 61-67) and is done on more than one hole thus it is formed on a plurality of positions and forms a plurality of flow directors on the wall of the component (column 4 lines 63-54).

Claims 11, 12 and 13 one layer can comprise a metal while another layer comprises a ceramic (column 2 lines 61-67).

Claim 14, the component can comprise a secondary coolant slot (figure 6) in the substrate and this is enhanced by the flow director (the film on top of the slot) as this film makes the slot have a deeper depth and thus enhances the secondary coolant flow (column 9 lines 59-67).

Claim 15, the deposition can be done using CVD or PVD (column 5 lines 47-67).

Claim 16, Bunker et al. discloses that there is a masking step (column 2 lines 50-60).

Claim 17, all the features of this claim have been discussed above except that the part is a turbine component, which is disclosed in column 2 lines 13-24.

Claim 18, Bunker et al. discloses forming a plurality of layers on the wall and shaping the layers in a predetermined shape to form the flow director (column 2 lines 50-60).

Claims 19, 20 and 23 these claims have been described previously above.

Claim 24, Bunker et al. discloses that the protective coating is formed on the hot gas path surface of the component (column 2 lines 40-45).

Claim 27, the wall has four sides and can broadly be classified as a polygonal.

7. Claims 1-5, and 27 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Haselbach (US Patent No. 6,817,833).

Haselbach discloses a method for forming a flow director on a wall and a cooling hole with a layer formed on the passage wall of the hole (Figures). The flow director is configured to spread the coolant flowing from the hole and out the exit site laterally (Figures). Haselbach discloses forming multiple flow directors, i.e. depositing multiple layers, on the hot surface of the wall (Column 3, lines 9-10). In a situation where no coolant is supplied, the flow director can be considered to be through a hot gas flow path. Haselbach discloses the protrusion finishes off with the surface of the turbine blade and therefore the protrusion does not extend over the exit slit (Column 2, lines 52-53).

Claim 27 – Haselbach discloses forming a rounded flow director (Figures, column 3, lines 10-15).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-5, 10-20, 23, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bunker et al.

Bunker teaches all that is discussed above. While the examiner maintains the position that Bunker discloses multiple flow directors as discussed in the 35 USC 102(b) rejection above, Bunker discloses providing a slot on a high temperature surface to provide more effective cooling for a row of cooling holes. Additionally, Bunker discloses providing multiple rows of cooling holes and therefore it would have been obvious to one of ordinary skill in the art to have provided multiple slots, one over each of a multiple row of cooling holes, with a reasonable expectation of successfully providing effective cooling of the high temperature substrate.

10. Claims 6-9, 21 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Bunker et al. in view of Sabol et al. (US Patent No. 6,060,174).

Claims 6 and 21, Bunker et al. discloses all of the features of the claims as discussed above except it does not disclose delivering a mixture through a nozzle onto the wall to form the layer wherein the mixture comprises a powder dispersed in a liquid



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medium. However, Sabol et al. teaches that when applying a MCrAlY film it can be applied as a powder slurry in a liquid medium using a slurry spray and that this technique is less expensive (column 3 lines 11-49). Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bunker et al. to use a slurry spray to apply the MCrAlY coating as suggested by Sabol et al. as this method is less expensive.

Claims 7 and 22, the part is a turbine engine part and the layer will be heated upon use of the part.

Claim 8, the nozzle must be displaced relative to the wall in order to spray coat the entire surface this would be done in accordance with the shape of the wall.

Claim 9, the spraying would obviously be controlled so that the wall is coated and not other parts that are not supposed to be coated this would be done in accordance with the shape of the wall.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 6,881,439.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Turocy whose telephone number is (571) 272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Turocy  
AU 1762



**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**